

From: [Mehmet Karagöz \(Flight Operations Engineer\)](#)
To: [Sam Buckwalter](#)
Cc: [Floer Projects](#)
Subject: RE: ARINC 424 View/Position regarding coding of Racetrack Procedures into NDB
Date: Thursday, May 26, 2022 7:46:19 AM

External (mehmet.karagoz@sunexpress.com)

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Dear Sam,

I hope this e-mail finds you well and everything is fine on your side.

I am working as Flight Operations Engineer in SunExpress dealing with NavDB, E-Charting Aircraft Performance etc.

As a late follow-up to my colleague Mehmet Yaman's previous questions regarding Racetrack's, we have new ideas which can be evaluated on NDB Subcommittee.

We would like to propose a potential solution regarding code of racetrack procedures which can be implemented ARINC424 Lay-out.

As you know, there is no Path Terminator defined for retrack procedures and previous Subcommittee meetings decided that the solution cannot be found without a new Path Terminator.

In the past we have coded them as an interim solution with the assignment of specific waypoints, but as the direction of STAR changes, entry into them becomes tricky and sometimes not compliant with Racetrack/Holding Entry Procedures.

However, code of them might be possible with integration of HF-Holding Single Circuit path terminator.

Please check the screenshot at the end of e-mail.

Is it possible to code them in that manner?

The only limitations I see is, CD Leg is not defined for Approach Transition Route Types According to ARINC424 document.

That might be something which can be discussed on NDB Comitee meetings and "CD" can be made applicable to Approach Transitions as well.

Additionally, another issue on this coding is the aircraft enters the Holding procedure and completes a full single circuit on Holding Pattern.

However, full circuit of Holding after entry is not needed on Racetrack procedure, and aircraft can be directed in to Racetrack after entry.

On below table, I have used HF for only entry into Holding.

If a new path terminator is created on ARINC 424, lets say "HE-Holding Entry", this Path Terminator

can also be used instead of HF on below table.

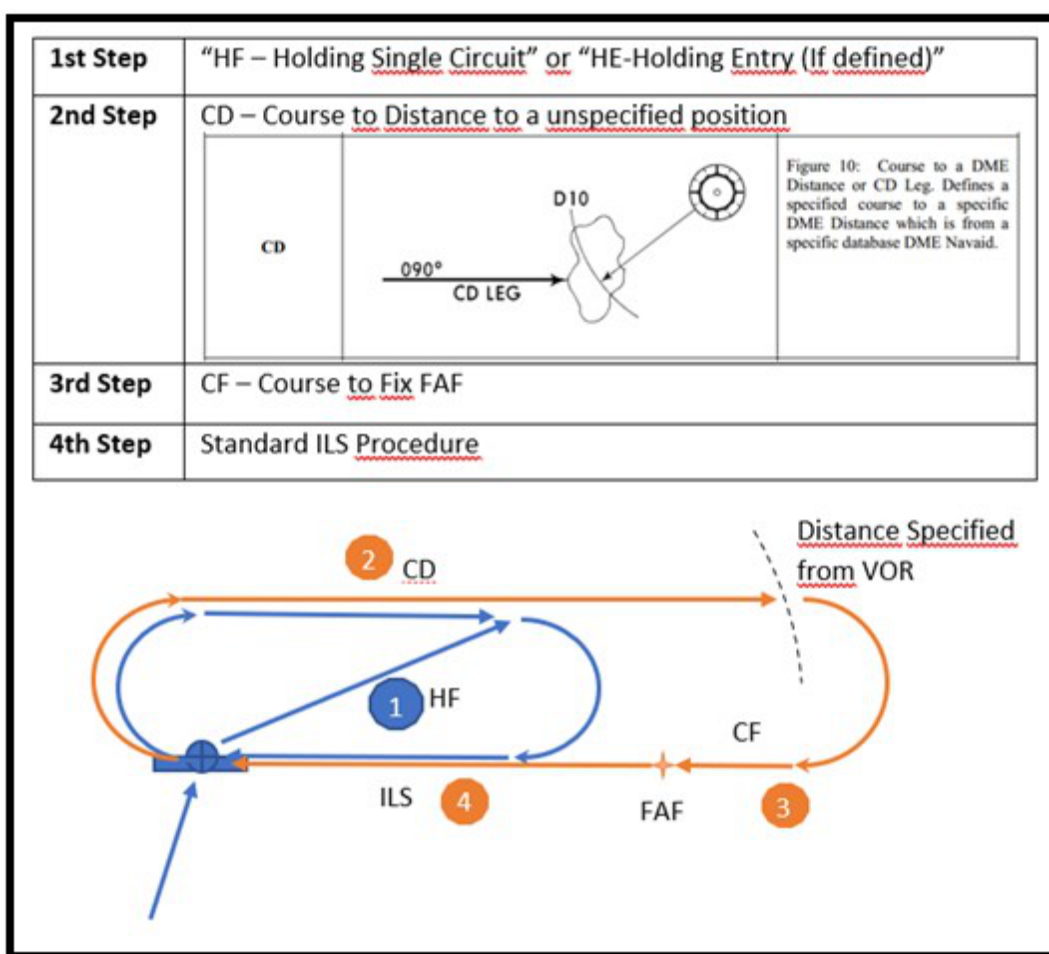
My humble opinion is, creating this Path Terminator should be doable since HF already performs holding entry, just the full single circuit part will be removed from the HF logic.

By the way, a full circuite after entry into holding will be eliminated and it will become possible to code all racetrack procedures.

We kindly would like to raise this proposal into NDB Comitee meetings.

Please inform us if any paper is needed for further evaluation.

Thanks for your support, kind regards.



Mehmet Karagöz
Flight Operations Engineer

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-----Original Message-----

From: Mehmet Yaman (Flight Operations Engineer) <Mehmet.Yaman@sunexpress.com>
Sent: 26 Mayıs 2022 Perşembe 14:08
To: Mehmet Karagöz (Flight Operations Engineer) <mehmet.karagoz@sunexpress.com>
Subject: FW: ARINC 424 View/Position regarding coding of Racetrack Procedures into NDB

-----Original Message-----

From: Mehmet Yaman (Flight Operations Engineer) <Mehmet.Yaman@sunexpress.com>
Sent: 15 Mayıs 2020 Cuma 15:39
To: Sam Buckwalter <Sam.Buckwalter@sae-itc.org>
Cc: FLTOPS.engineering <FLTOPS.engineering@sunexpress.com>
Subject: RE: ARINC 424 View/Position regarding coding of Racetrack Procedures into NDB

Hello Sam,

We appreciate your help and detailed notes/view of NDB Subcommittee regarding our questions.

We did understand that at the moment it is not possible to code the racetrack procedure by NavDB providers due to lack of standard and lack of required path terminators. We hope that issue will be solved in the near future which will decrease the extra workload on operators and will eliminate the exposed risks due to tailored racetrack procedure design by operators instead of NavDB providers.

Thanks again for raising that issue during meeting and helping us to get the official view of NDB Subcommittee.

With kind regards.

Mehmet Yaman
Flight Operations Engineer

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From: Sam Buckwalter [<mailto:Sam.Buckwalter@sae-itc.org>]

Sent: Monday, April 27, 2020 11:31 AM

To: Mehmet Yaman (Flight Operations Engineer) <Mehmet.Yaman@sunexpress.com>

Cc: FLTOPS.engineering <FLTOPS.engineering@sunexpress.com>

Subject: RE: ARINC 424 View/Position regarding coding of Racetrack Procedures into NDB

Hello Mehmet:

The NDB Subcommittee had a virtual meeting last week. I submitted your below email as working paper for the groups review. Below is the synopsis of the discussion.

Sam Buckwalter, ARINC IA, introduced an email he had received from Sun Express on coding of Racetrack procedures into Navigation Databases. Martin Zillig, Lufthansa Systems, reported that HF leg racetrack located at airports are missing in the database.

Martin advised this is a legacy issue and has been known for many years but has not been resolvable. Martin advised the only way to resolve this issue is to create a new path terminator. The question arose of how many cases are there. Martin advised that in a quick count he found 1600 cases, and that was on a limited search. He expects the more realistic number is closer to 5000 worldwide.

Discussion focused on creating a new path terminator. Martin advised that there is significant work to create to new path terminator. The FMS Manufacturers advise creating a new path terminator will not solve this issue as will years out before it is implemented in FMS.

Dave Nakamura, MITRE, noted that the problem is much bigger than just adding a new path terminator for RNAV procedures. Right now, there is no functional or performance standards for RNAV holding or procedure design. It only exists for RNP. Even with RNP, the specification of holding path terminators does not come with guidance on the conduct of a procedure that contains them, other than entry/exit criteria. And while there is an old RNAV MOPS, DO-187, it does not have any functional standards for routes, procedures or path terminators. Having the addition of a new leg terminator, e.g. HI leg, be the reason for an effort to develop such RNAV standards would take a huge cost benefit or mandate to get there. Dave noted without the standard, there can be no means

for certification of such capability.

The consensus of the group was there is no way to resolve this issue with the current path terminators and only alternative to solve it long term would to create a new path terminator, for example HI Leg.

Josh Fenwick, Garmin, accepted the action to draft position paper outlining the new path terminator. Dave Nakamura, MITRE, recommended that position paper be forwarded to the SC 227, Standards of Navigation Performance committee so that can further propagate the issue to industry.

Sam Buckwalter

Program Director

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From: Mehmet Yaman (Flight Operations Engineer)

<Mehmet.Yaman@sunexpress.com<<mailto:Mehmet.Yaman@sunexpress.com>>>

Sent: Tuesday, February 18, 2020 8:14 AM

To: Sam Buckwalter <Sam.Buckwalter@sae-itc.org<<mailto:Sam.Buckwalter@sae-itc.org>>>

Cc: FLTOPS.engineering

<FLTOPS.engineering@sunexpress.com<<mailto:FLTOPS.engineering@sunexpress.com>>>

Subject: ARINC 424 View/Position regarding coding of Racetrack Procedures into NDB

Dear Sam,

We would like to ask you below question regarding the coding of Racetrack Procedures into Navigation Database;

We have the information that racetrack procedures are not coded anymore into navigation databases by both Jeppesen and Lufthansa Systems due to the lack of a viable coding solution in accordance with ARINC424.

We would like to kindly ask you to provide us the official view/feedback of ARINC424 Navigation Data Base (NDB) Subcommittee whether it is possible to code racetrack procedures into NDB according to ARINC424 or not, which might be an already published announcement letter, any kind of publication or documentation/report by ARINC 424 Navigation Data Base (NDB) Subcommittee.

Could you please help and guide us on this matter?

Thank you.

With kind regards,

Mehmet Yaman
Flight Operations Engineer

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